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| EXAMINER |
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KONG, SZE-HON

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08/31/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/529,023 | Applicant(s) YANG ET AL. | |
| | Examiner Sze-Hon Kong | Art Unit 3661 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,7-13,15 and 17-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,7-13,15 and 17-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 6/22/2010 have been fully considered but they are not persuasive.
2. Applicant's arguments with respect to claims 1, 4, 5, 7-13, 15 and 17-22 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 5 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Isonuma (6,611,283).

As per claims 5 and 7, Isonuma discloses an apparatus for identifying a fixation point in a stereo image comprising first and second displays for displaying different mono images of an object to individual eyes, a stereo image presentation module for visually super-posing the mono images to form the stereo image, a first and second eye tracker for tracking fixation points of each individual eye relative to the mono image displayed to that eye; and a processor for calculating a three-dimensional position relative to the object based on the fixations; wherein the first mono image and the second mono image are different images (Abstract, fig. 2A, 13, col. 3, lines 16-58, col. 9, lines 43-53 and col. 10, lines 17-32).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borst et al. (WO 95/01757) and Wang et al. (6,965,812).

As per claims 1, 4 and 8, Borst et al. discloses the claimed remote controlled robotic manipulator for manipulating a moving object comprising a motion sensor for sensing motion of a reference region of an object to be manipulated, and a controller for locking motion of the robotic manipulator relative to the reference region of the object based on the sensed motion (Page 1, lines 9-17; Page 8, line 10 – Page 9, line 34; Page 10, lines 1-5; Page 10, lines 15-24; Page 11, lines 5-29; Page 22, line 32 – Page 23, line 14). Borst et al. further discloses the claimed manipulator in which the user views a remote representation of the object (Page 14, line 34 – Page 15, line 1; Page 17, lines 18-22; Page 19, line 30 – Page 20, line 5). The reference region is within a human undergoing surgery and wherein the object is a tissue that is the subject of the surgery (Page 7, lines 16-20; Page 12, line 31 – Page 13, line 5; Col. 22, lines 22-26).

Borst et al. does not explicitly disclose the claimed the robotic manipulator, is arranged to dynamically change the reference region to which its motion is locked to reflect movement in a visual fixation point of a user, and the controller is arranged to lock the motion of the robotic manipulator relative to different motions sensed at

Art Unit: 3661

different regions of the object as the user visually fixates on different points of the object. Wang discloses a robotic system for controlling surgical instrument by a user dynamically change the reference region to which the robotic manipulator motion is locked to reflect movement in a visual fixation point of a user, and the controller is arranged to lock the motion of the robotic manipulator relative to different motions sensed at different regions of the object as the user visually fixates on different points of the object (Col. 4, lines 5-13). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Borst et al. to dynamically change the reference region locked by the robotic manipulator according to the visual fixation point of a user, taught by Wang to conveniently control the movement of the robotic manipulator to the desire location of the object in real-time.

As per claim 12, Borst et al. further discloses the claimed manipulator comprising left and right LCD displays that display left and right images (Page 35, lines 33-34).

7. Claims 9, 10, 11, 13, 15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borst et al. (WO 95/01757) and Wang et al. (6,965,812) as applied to claims 1 and 8, and further in view of Isonuma (6,611,283).

As per claims 9 and 10, Borst et al. does not explicitly disclose the claimed motion sensor tracking the visual fixation point of the user, wherein the controller determines the reference region of the object based on a signal from an eye tracking apparatus that tracks a visual fixation point of one or more eyes of a user, wherein the eye tracking apparatus identifies the visual fixation point of the user and tracking the fixation point of each eye, and an eye tracker for tracking the fixation point of each eye.

Isonuma discloses an eye tracking apparatus that tracks a visual fixation point of one or more eyes of a user and identifies the visual fixation point of the user who is observing a stereo image formed by visually superposing mono images, comprising the steps of presenting one mono image to each user eye to form the stereo image and tracking the fixation point of each eye (Abstract, col. 3, line 12 – col. 4, line 3, col. 5, lines 12-23, col. 7, line 62 – col. 8, line 12, col. 9, lines 43-53 and col. 10, lines 17-32). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Borst et al. to tracks visual fixation point of a user observing a stereo image formed to each user eye, taught by Isonuma to accurately determine the depth of the user eye fixation by the different mono images present to each user eye providing natural viewing pattern for the left and right eye.

As per claims 11, Borst et al. does not disclose a three-dimensional position of the visual fixation point is determined. Isonuma discloses determining a three-dimensional position of visual fixation point (Abstract, col. 3, lines 16-39). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Borst et al. to determine a three-dimensional position of visual fixation point of a user, taught by Isonuma for accurately determine the depth of the visual and operation region.

As per claims 13, 15 and 17-20, Borst et al. discloses the claimed remote controlled robotic manipulator for manipulating a moving object comprising a motion sensor for sensing motion of a reference region of an object to be manipulated, and a

Art Unit: 3661

controller for locking motion of the robotic manipulator relative to the reference region of the object based on the sensed motion (Page 1, lines 9-17; Page 8, line 10 – Page 9, line 34; Page 10, lines 1-5; Page 10, lines 15-24; Page 11, lines 5-29; Page 22, line 32 – Page 23, line 14). Borst et al. further discloses the claimed manipulator in which the user views a remote representation of the object (Page 14, line 34 – Page 15, line 1; Page 17, lines 18-22; Page 19, line 30 – Page 20, line 5). Borst et al. further discloses wherein the first mono image and the second mono image are obtained from different sensors that are observing a human body as part of a surgery (Page 1, lines 9-17); the reference region is within a human undergoing surgery and wherein the object is an organ that is the subject of the surgery (Abstract, page 7, lines 15-20; Page 12, line 31 - Page 13, line 5; Page 22, lines 22-26).

Borst et al. does not explicitly disclose the claimed the robotic manipulator, is arranged to dynamically change the reference region to which its motion is locked to reflect movement in a visual fixation point of a user, and the controller is arranged to lock the motion of the robotic manipulator relative to different motions sensed at different regions of the object as the user visually fixates on different points of the object and the eye tracker tracks the fixation point of each eye of a surgeon. Wang discloses a robotic system for controlling surgical instrument by a surgeon dynamically change the reference region to which the robotic manipulator motion is locked to reflect movement in a visual fixation point of a user, and the controller is arranged to lock the motion of the robotic manipulator relative to different motions sensed at different regions of the object as the user visually fixates on different points of the object (Col. 4, lines 5-13). It would

Art Unit: 3661

have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Borst et al. and Isonuma using a stereo image eye tracking apparatus to dynamically change the reference region locked by the robotic manipulator according to the visual fixation point of the surgeon, taught by Wang to conveniently control the movement of the robotic manipulator to the desire location of the object in real-time and accurately fixate on the desired operation region.

As per claims 21 and 22, Borst et al. discloses the stereoscopic video imaging allow the surgeon to see depth of the subject of interest (Page 17, lines 18-22), but does not specifically disclose the motion sensor is arranged to determine a depth of the visual fixation point and the depth is determined by an angle of a gaze of the user's eyes. Isonuma discloses an eye tracking apparatus detecting the motion of each eyes of the user to determine the depth of the visual fixation point by an angle of a gaze of the user's eyes (Abstract, Col. 3, line 12 - col. 4, line 8, col. 5, lines 12-23 and col. 7, line 62 - col. 8, line 12). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the invention of Borst et al. to detect the depth of visual fixation point by an angle of a gaze of the user's eyes in eye motion tracking, taught by Isonuma to accurately determine the position/depth of a point of interest of the user to perform operation.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 3661

(5,626,595) Sklar et al. discloses a automated surgical instrument utilizing eye tracking apparatus to track the location of the surgeon's eye to position the instrument.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sze-Hon Kong whose telephone number is (571)270-1503. The examiner can normally be reached on 7:30AM-5PM Mon-Fri, Alt. Fri. Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on (571) 272-6956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sze-Hon Kong/
Examiner, Art Unit 3661

/Thomas G. Black/
Supervisory Patent Examiner, Art Unit 3661